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INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference 010264WOJZF	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/US 03/35366	International filing date (day/month/year) 05.11.2003	Priority date (day/month/year) 08.11.2002
International Patent Classification (IPC) or both national classification and IPC B29C45/16		
Applicant OMNOVA SOLUTIONS INC. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

I Basis of the opinion
II Priority
III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
IV Lack of unity of invention
V Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
VI Certain documents cited
VII Certain defects in the international application
VIII Certain observations on the international application

Date of submission of the demand 02.06.2004	Date of completion of this report 09.02.2005
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Kujat, C Telephone No. +49 89 2399-2360



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**INTERNATIONAL PRELIMINARY
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International application No. PCT/US 03/35366

I. Basis of the report

1. With regard to the elements of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-21 as originally filed

Claims, Numbers

1-9 filed with telefax on 09.11.2004

Drawings, Sheets

1/4-4/4 as originally filed

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- contained in the international application in written form.
- filed together with the international application in computer readable form.
- furnished subsequently to this Authority in written form.
- furnished subsequently to this Authority in computer readable form.
- The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- the description, pages:
- the claims, Nos.:
- the drawings, sheets:

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5. This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	1-9
Inventive step (IS)	Yes: Claims	
	No: Claims	1-9
Industrial applicability (IA)	Yes: Claims	1-9
	No: Claims	

2. Citations and explanations

see separate sheet

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Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

- D1: US 2002/039656 A1 (OMNOVA SOLUTIONS) 4 April 2002 (2002-04-04)
- D2: WO204186
- D3: ROSATO, DONALD V: "Injection moulding handbook" 1995, CHAPMAN&HALL , NEW YORK , XP002272930
- D4: PATENT ABSTRACTS OF JAPAN vol. 1999, no. 11, 30 September 1999 (1999-09-30) & JP 11 147236 A (UBE IND LTD), 2 June 1999 (1999-06-02)

- 1.1 With regard to independent method claim 1, document D1 discloses a method for assuring that coated moulded articles meet predetermined quality standards (Any injection moulded article is manufactured to meet predetermined quality standards. In addition to that, D1 discloses such standards in paragraphs 0012, 0063 and 0065: "acceptable parts", 0074: "acceptable, i.e. good appearance and adhesion"), said articles being formed entirely in a mould by a process that includes forming a substrate from a first composition using a first set of process conditions (see process conditions for the substrate in table II) and subsequently, using a second set of process conditions (see the process conditions for the coating in table II; see paragraph 56: "coats a predetermined portion"), coating said substrate by injecting a coating composition into said mould and allowing said coating composition to cure on said substrate so as to provide a coated moulded article (see the entire disclosure of D1), said method comprising:
- a) inspecting a first coated moulded article manufactured by the process after said article is removed from said mould (paragraphs 0063 to 0066 disclose an approach of determining process conditions. Obviously, the article is inspected after demoulding.),
 - b) determining whether said coated moulded article meets quality standards for substrate formation (see paragraph 64: "complete filling of the mould") and, if the article does not meet such standards, modifying the substrate formation step of the process by adjusting (paragraph 64: "optimize these") one or more of first

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composition injection volume, first composition injection temperature, first composition injection pressure, and substrate moulding pressure (see process conditions for the substrate in table II; see paragraph 64); and c) determining whether said coated article meets quality standards for coating (see paragraphs 0013 and 0074) and, if the article does not meet such standards, modifying the coating step of the process by adjusting (paragraph 64: "different machine variables are tried") one or more of cure time, injection time, injection pressure, injection volume, injection temperature, and mould temperature at injection of said coating composition (see process conditions for the coating in table II), wherein the determination of step © comprises determining (I) whether said coating is intermingled with said substrate (D1, paragraph 0076: "injecting the IMC at the proper time immediately after the surface of the substrate resin cools below its melt temperature as compared with an injection that occurs too early"; table in paragraph 0076: "with the coating intermingled with the substrate"), (ii) whether a surface appearance of said coating is acceptable (D1, paragraph 0008: "good surface quality", paragraph 0013: "good flow and coverage", paragraph 0074: "good appearance", table in paragraph 0076: "parts have good/poor appearance"), and (iii) whether said coating is sufficiently adhered to said article (D1, paragraph 0013: "good adhesion", paragraph 0074: "good ... adhesion", table in paragraph 0076: "with coating not having good adhesion").

- 1.2 The subject-matter of **claim 1 is therefore not novel** (Article 33(2) PCT) over the disclosure of document D1.
2. Dependent claims 2 to 9 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty, the reasons being as follows:
 - 2.1 The additional features of dependent claim 2 have already been disclosed in document D1. In particular, see paragraph 0064: "complete filling".
 - 2.2 The additional features of dependent claim 3 have already been disclosed in document D1. In particular, see paragraphs 0056, 0057, 0064 and table II.

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- 2.3 The additional features of dependent claim 4 have already been disclosed in document D1. In particular, see paragraph 0007: "immediately after the workpiece cools to its melt temperature".
 - 2.4 The additional features of dependent claim 5 have already been disclosed in document D1. In particular, see paragraph 0058: "pressure transducer 180, ... temperature transducer 182".
 - 2.5 The additional features of dependent claim 6 have already been disclosed in document D1. In particular, see paragraphs 0066, 0071, 0076 and 0077.
 - 2.6 The additional features of dependent claim 7 have already been disclosed in document D1. In particular, see paragraph 0067: "the machine settings found to yield optimum results". The machine control disclosed in D1 controls the injectors incorporated into the mould. Further, that machine control is connected to pressure and temperature transducers in the mould. Therefore, the control apparatus of D1 is "operatively associated with said mould".
 - 2.7 The additional features of dependent claim 8 have already been disclosed in document D1. In particular, see paragraphs 0066, 0067 and 0070: "trial and error technique", "generate a certain amount of scrap", "trial and error using a bracketing procedure".
 - 2.8 The additional features of dependent claim 9 have already been disclosed in document D1. In particular, see paragraph 0021: "single system control". The machine control disclosed in D1 controls the injectors incorporated into the mould. Further, that machine control is connected to pressure and temperature transducers in the mould. Therefore, the control apparatus of D1 is "operatively associated with said mould".
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- 3.1 With regard to the additional features of dependent claims 7 and 9, document D2 discloses an injection mould for multi-component injection moulding (page 4, line 9: "Mehrkomponenten Spritzguss") wherein process conditions used to create articles meeting required quality standards (page 3, line 9: "während dem

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"Produktionsprozess ermittelt" relates to conditions meeting these requirements; page 5, line 2: "einzufahren bis Produktionsreife erreicht wird") are stored in a control (page 4, line 1: "Stellgrößen bedient" relates to control being exerted by "Schnittstellenteil 1") apparatus (page 6, line 7: "Schnittstellenteil 1") associated with said mould (page 2, line 23: "in einer Form integriert") such that said process conditions can be recalled (page 3, line 21: "alle relevanten Daten an die Spritzgiessmaschine übergeben") for use in future moulding operations.

- 3.2 It is considered obvious for the person skilled in the art, namely when the same result is to be achieved, to apply the features disclosed in document D2 with corresponding effect to an IMC-mould according to document D1 without the exercise of inventive skill. Especially, since "in-mould coating" is also considered a multi-component injection moulding process.
- 3.3 With regard to the usual approach of the skilled person for determining whether moulded parts meet predetermined quality standards, document D3 discloses that "the live production run is usually controlled by continuous visual inspections of the mouldings and by checking their weight and a few dimensions" (page 52, right column, second and third paragraphs). Further, document D4 discloses that usually a "visual outer appearance quality judgement result provided by an operator after the trial moulding is required" (PROBLEM TO BE SOLVED).
4. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1 to D4 is not mentioned in the description, nor are these documents identified therein.

CLAIMS

What is claimed is:

1. A method for assuring that coated molded articles meet predetermined quality standards, said articles being formed entirely in a mold by a process that includes forming a substrate from a first composition using a first set of process conditions and subsequently, using a second set of process conditions, coating said substrate by injecting a coating composition into said mold and allowing said coating composition to cure on said substrate so as to provide a coated molded article, said method comprising:
 - 10 a) inspecting a first coated molded article manufactured by the process after said article is removed from said mold;
 - b) determining whether said coated molded article meets quality standards for substrate formation and, if the article does not meet such standards, modifying the substrate formation step of the process by adjusting one or more of first composition injection volume, first composition injection temperature, first composition injection pressure, and substrate molding pressure; and
 - 15 c) determining whether said coated molded article meets quality standards for coating and, if the article does not meet such standards, modifying the coating step of the process by adjusting one or more of cure time, injection time, injection pressure, injection volume, injection temperature, and mold temperature at injection of said coating composition,
- 20 said mold optionally having a constant volume maintained throughout the process.
- 25 2. The method of claim 1 wherein the determination of step (b) comprises evaluating whether said article exhibits at least one of voids and inadequate filling of said mold by said first composition.
- 30 3. The method of any of claims 1 to 2 wherein said first set of process conditions includes one or more injection pressures for said first composition, one or more injection temperatures for said first composition, one or more injection volumes for said first composition, one or more injection times for said coating composition, one or more injection pressures for said coating compositions, one

or more injection volumes for said coating composition, and one or more cure times for said coating composition.

4. The method of any of claims 1 to 3 wherein the determination of step 5 (c) comprises determining at least one of (i) whether said coating penetrated said substrate, (ii) whether a surface appearance of said coating is acceptable, and (iii) whether said coating is sufficiently adhered to said article.

5. The method of any of claims 1 to 4 wherein said coating composition 10 is injected into said mold after said substrate has cooled to a point where said first composition is below its melt temperature.

6. The method of claim 5 wherein said point is determined by monitoring in said mold at least one of a temperature and an internal pressure.

15 7. The method of any of claims 1 to 6 wherein the modification of step (c) is performed by adjusting at least one of a time at which said coating composition is injected into said mold relative to a time at which the substrate formation step of the molding process is begun, a time at which said mold is 20 opened and the coated article is removed from said mold relative to a time at which said coating composition is injected in said mold, and an injection pressure for said coating composition.

25 8. The method of any of claims 1 to 7 wherein values for one or more of said process conditions for the substrate formation and coating steps are controlled and recorded by a control apparatus operatively associated with said mold.

30 9. The method of any of claims 1 to 8 wherein steps (a) through (c) are performed repeatedly until a coated article that meets said quality standards is produced.

35 10. The method of any of claims 1 to 9 wherein the process conditions used to create the coated article meeting said quality standards are stored in a control apparatus associated with said mold such that said process conditions can be recalled for use in future molding operations.

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